

## **SOUND TECHNOLOGY FOR CARNATIC CONCERTS**

By G. Raj Narayan

Carnatic music has taken quite a few twists and turns in the last fifty years. The likes of GNB, Ariyakudi and Rajarathnam Pillai, to name a few, brought in certain innovations to charge up the placid music of those days. The likes of Lalgudi, MSG, Mali, Balachander, Emani, to name a few more, subsequently added modernity, new techniques and refinements. The last two decades have however seen the introduction of many new instruments like the mandolin, guitar, saxophone, etc. along with electronic aids such as the magnetic/ piezo pick-ups, electronic tamburas, amplifiers, sensitive microphones, multi-channel mixers and booming loudspeakers. The use of these seemingly simple and commonly used gadgets has introduced quite some technology onto the laps of the unsuspecting performers. The result, in most cases, has not been the soundest! Our performers as well as the organisers of concerts would be able to provide a better musical experience for the audience if they devoted at least some attention to these devices that are taken for granted.

This author has been advocating the utilisation of “Sound Engineers” for evenly balancing the microphone signals of the stage for more than a decade. However this has fallen on deaf ears. It is now time to enforce this. A Sound Engineer, for the purpose of a classical music sabha, need not be a qualified specialist as such, but one with a fair knowledge of the various types of microphones and their use, knowledge of handling a mixer and most importantly, ability to distinguish between the sounds of various musical instruments and voices. This role could very well be filled by college science students, with a good ear for carnatic music, who would get an opportunity to specialise in this activity over a period of time. It should be the responsibility of these designated Engineers to set the slider controls as they deem fit and not be browbeaten by the performers on stage. It is time we got over the general practice of letting an illiterate vagabond handle the microphones and its amplifier without knowing the difference between a microphone and a cricket ball.

The performers on stage require sufficient feedback for “their comfort”. However, provision of a loudspeaker for this purpose also induces the all too familiar howl in the audio system due to the feedback being picked up by the microphones. This therefore requires careful attention to the placement of the feedback loudspeaker(s). Wouldn't it be a good idea to place four independent loudspeakers behind each of the performers with the sound of only their own instrument / voices with separate volume controls for each of these? The question of each performer wanting to raise his/ her volume would never again arise! Jokes apart, the genuine utility of a feedback speaker would be greatly appreciated by any vainika, who cannot even hear themselves on stage when blessed with a mridangam accompanist on the rampage. More on vainikas later.

There is more to a PA system than just a few microphones fitted on to rusty rods, a dusty and dented amplifier with a few knobs and a couple of large loudspeakers with torn cloth fronts and split cabinets! A good microphone is a very sensitive piece of equipment that can be easily deteriorated by dust and physical shock. Sensitive microphones can also be damaged by a hard tap with the fingers, the kind that most musicians use to check if the microphone is switched on! Imagine the state of the microphones that the microphone boys bring in a box stuffed with cables, wires, tools, etc. in a rickety bumpy autorickshaw or truck! This would be a true reflection of the classical music to be performed at that venue, indeed. Having said that, it is equally important to ensure that

the cables connected to the microphones are of the right type and quality. Microphones generate extremely weak signals that need to be amplified heavily to produce sound through the loudspeakers. The weak signals can easily deteriorate further or be drowned out by noise if the cables are of poor quality. Quality in this context refers not only to the materials used in the cable, but also to the condition of the soldered connections at the two ends and the quality of the contact that it establishes on to the microphones or amplifier. This is one of the weakest and most neglected links in our auditoriums that cause the greatest amount of problems during a concert. The best of the imported microphones are of no use if the connecting cables are badly maintained.

Amplifiers are available in various ranges in terms of cost, power output, number of channels and other features. The number of channels are not important if one chooses to use a dedicated multi-channel mixer that should be the right scheme of things. The mixer allows the correct volumes of each of the microphones to be fed into the amplifier. Most mixers also allow tone controls on each microphone channel to suit the instrument or voice that it is picking up. This is most useful from the point of view of a musical performance. It is a sad reflection on the state of our music concerts that mixers are rarely seen. Even in those instances that they are used, an incompetent operator invariably destroys its utility.

The need for and utility of a mixer is not easily understood by most carnatic music aficionados. Most performers, organisers and the audiences are happy to see four microphones placed on the stage, one for each performer. Why hasn't anyone wondered why a two sided mridangam is provided with only one microphone for the right hand alone? If a separate microphone can be provided for the dagga (left hand instrument of a pair of tabla) in a hindustani concert, why not a separate microphone for the left hand of the mridangam? The sweetness and depth that the left hand of the mridangam (played by a sensitive artiste, of course) can add to the music needs to be cultivated. The reluctance to using two microphones obviously stems from two facts. The first could be the hurt ego of the main performer if he/ she is given only one microphone. The second is the threat seen by the main performer of an over-amplified mridangam. This is exactly where the Sound Engineer's role comes in. Further, why hasn't anyone bothered about the way our vocalists "sing to the violinist or the mridangam artiste"? When they are no longer crooning into the microphone during the excited swaraprasthara duels with the accompanists, their voices are weakly picked up by the microphones. This therefore results in fluctuations in their volume levels that can be quite irritating if one has not experienced this yet. This also makes the task of the Sound Engineer very difficult. It is therefore very necessary for the vocalists to be provided with two microphones, each angled on either side so that a reasonable amount of movement of his/ her face is possible without much variation in the pick up of the voice. This argument does not arise for any of the accompanists since it would be too much of a circus if they too resorted to moving their instruments around, wouldn't it? Finally, what about hearing the tambura? The drone of the tambura in the background of a concert is as pleasing to the audience as the performers. Why are our performers so shy of amplifying the tambura so that the audience too can hear it? With the advent of the compact electronic tambura, performers are even found placing these in front of them (so that they can never be picked by the microphone ?) and denying the accompanists a sufficient dose of sruthi. If we can all appreciate the abundant use of tanpuras on the stage of a hindustani concert, why do we try to subdue it in our carnatic concerts? Taking these facts into account, a minimum of seven microphones seem to be required for a concert involving four performers. Very few amplifiers are provided with any more than four microphone inputs and so this should

convince the carnatic music buffs of the need for a Mixer, not considering the further benefits of independent tone controls, monitor outputs, superior quality of mixing, etc.

The last consideration as far as equipment are concerned, relates to the loudspeakers. Most of the concerts are conducted in halls meant for a variety of functions ranging from weddings to break-dance. Under these circumstances, no audio system is provided in such halls and the organisers rely on the ever familiar black box placed on a rusty metal stand that seeks to achieve a rapport between the performers and the audience. What most people do not realise is that this one component could completely transform a beautiful voice into the most unpleasant noise in spite of the use of the best microphones and amplifiers in the world. Like the microphones, the loudspeakers are also delicate equipment that need to be protected from dust, moisture and heavy physical shocks, attributes that are unlikely to be appreciated by unqualified operators. Small sabhas routinely depend on the services of P.A. system hirers who use the same set of equipment for an election campaign on a rainy day and a classical music concert the next day. What one needs to appreciate is that even a mediocre, inexpensive but matched set of equipment comprising the microphones, amplifier and speakers can result in acceptable reproduction if they are properly handled and taken care of.

It is surprising to find even some modern large auditoriums fitted with only one set of powerful loudspeakers on either side of the performing stage, with no supplementary loudspeakers along the sides or end of the auditorium. This naturally results in too loud a volume for people seated in the front and too feeble a volume for those at the rear. There have been quite a few instances of audiences seated in the front row listening to the concert with their ears covered with their hands to reduce the "pain". A better scheme would be to employ a series of loudspeakers along both the sides of the auditorium that would ensure an even distribution of the sound at comfortable levels for everyone. Such a scheme would also reduce, if not completely eliminate, the chances of a feedback howl.

## SELECTION AND USE OF MICROPHONES

It is time to devote some attention to the selection and use of the microphones on a concert platform. Without going into the technical details, a few basic guidelines may be offered. The first consideration would be the sensitivity of the microphone. Some microphones are more sensitive than the others. It is not always desirable to have very sensitive microphones. A higher sensitivity would also induce the production of feedback howls though this also depends on the hall acoustics. A low sensitivity would require the singer to literally swallow the microphone. With particular reference to vocalists, the selection and use of microphones needs considerable care. A vocalist normally tends to move his/ her face to either side either to interact with the accompanists or as part of their performing mannerisms. The microphone provided for vocalists should therefore possess a wider angle of its sensitivity and not be highly directional. The use of two such microphones for the vocalist can ensure an evenly balanced pick up of his/ her voice throughout the performance. At the same time, it is also the responsibility of the vocalists to ensure that they do not swing back and front excessively that would cause a reduction or increase in the sound volumes. It should be appreciated that these factors do not come into play for a veena or violin, but are applicable for flute, morching, etc. It is therefore the responsibility of the organisers and the P.A. system provider to ascertain in advance the nature of the concert and the performers so that the right microphones could be placed at each location on the stage.

Another important aspect of the use of microphones should be noted by our musicians, as well as speakers. Every mechanical gadget has a limit of its performance beyond which it would either distort or fail. So does a microphone. When one gets too near it and screams into it, the electrical signals have no other option than to get distorted. Lowering of the amplifier volume controls will be of no use under these circumstances as far as the tonal quality is concerned. A peculiar occurrence of such a situation arises with the use of over-sensitive microphones, which distort at the beginning of every phrase, whether it is speech or music. This is caused by a temporary blast of air into the microphone during the 'attack' phase of the phrase. Musicians and speakers should learn to identify this situation and immediately move back to increase the distance from the microphone.

As far as provision of microphones for instruments are concerned, one needs to be careful not only in selection of the type, but also in placement relative to the instrument. Microphones should not be placed in line with the blowing hole of a flute. This is likely to pick up the stray turbulence of the air, in line with the mouth, that flows outside the flute and is likely to cause a distorted tone. It should also not be placed near the open end of the flute and should preferably be placed near the middle of the flute. The microphone provided for an acoustic veena (without pick-up) should be placed close to the surface of its acoustic resonator and not near its bridge or strings. A low sensitivity microphone should be used (if one is required at all) for a nadaswaram or tavil.

With the introduction of a pick-up for veena, one needs to consider the pros and cons of the 'contact' type and the magnetic type. While the contact pickup results in a more faithful reproduction of the tonal quality of the veena, it also picks up extraneous noises such as a bangle touching the surface of the veena. A magnetic pick-up is more sensitive and picks up the vibrations of the strings directly rather than from the surface of the veena. This causes two aberrations. One, the poor quality and design of the pick-up prevents the higher harmonics of the string being picked up resulting in the loss of "sweetness" associated with acoustic veena-s. Two, the effect of the wooden resonator in an acoustic veena that modifies the tonal quality of the vibrating string to produce what we perceive as the familiar tone of the veena, is lost. But the advantage of the apparent higher sustenance and continuity of sound makes this type of pick-up more attractive. However, it has its own problems as far as the performer is concerned. The foremost is that the pluck should be very soft to take into account the higher sensitivity of the pick-up.

Irrespective of which type of pick-up is used, vainikas may be interested to know that the use of a pre-amplifier close to the veena would greatly improve the performance. This results in the fact that the pick-up signal being a very weak one, can get affected by hum and noise through the use of a long cable to the amplifier. By the use of a pre-amplifier preferably mounted on the veena itself, these weak signals can be amplified before being conveyed over the cable to the amplifier. An even better solution is to have an amplifier on the stage itself so that the performer can have the benefit of an independently adjustable feedback. The provision of a "line out" facility on the amplifier could be used to feed the P.A. system thereby completely eliminating the microphone and consequently reducing the possibility of a feedback 'howl'.

The violin is an instrument that is neither too loud nor too weak. The sustenance of its notes can be as long or as short as the performer desires. Hence the need for a contact pick-up as used by a few violinists these days is not seen except in exceptional cases where the artiste would like to be mobile. A decent microphone as used for the vocalist should perform fairly well. However, it is pertinent to point out that many violinists tend to

gradually move closer and closer to the microphone as the concert proceeds, ultimately reaching a point where the bow makes physical contact with it occasionally. This results in an unpleasant but avoidable 'thud' now and then.

Finally, coming to the use of an electronic tambura, performers would do well to use an extension speaker connected to the external speaker socket of the electronic tambura to evenly distribute the sound over the entire stage. This is in fact the very purpose for which the socket is provided. The sound is then heard from the speaker of the tambura as well as the extension speaker. In case a performer does not wish to take this trouble, then the tambura alone should be placed behind them at a distance of about a metre and set at a volume such that all the accompanists are able to clearly hear it. Placing it closer to the body would prevent the sound from dispersing evenly. Some performers are even found to use the electronic tambura without removing it from its carrying case which literally reveals their respect for sruthi!

We are living in a world filled with technology in every facet of our lives. It is therefore natural to expect a greater amount of technology entering classical music, be it a concert or practice or teaching session. It should therefore be the endeavour of every performer, organiser, teacher and member of the audience to appreciate the benefits of technology and to use it in the best manner to heighten the classical concert experience.